Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. - 35. (cancelled)

36. (currently amended) A magnetron treatment chamber comprising:

a magnetron source including

a target with a target surface and an opposite surface;

a magnet arrangement adjacent said opposite surface and having:

a) at least one first magnet subarrangement;

b) at least one second magnet subarrangement;

c) said first magnet subarrangement having a first area pointing towards said opposite surface and of one magnetic polarity;

d) said second magnet subarrangement having a second area pointing towards said opposite surface and of the other magnetic polarity;

e) said second area forming a loop around and ~~distant~~ distinct from said first area;

f) said first area generating a first magnetic flux through said target surface;

g) said second area generating a second magnetic flux through said ~~sputtering~~ target surface;

h) said second magnetic flux being larger than said first magnetic flux;

i) a third magnet subarrangement, generating a magnetic flux superimposed upon said second magnetic flux along a section of said second area;

~~said second magnetic flux being unevenly distributed along said second area;~~

j) a sweeping arrangement moving at least said ~~unevenly distributed~~ magnetic flux of said third magnet subarrangement along said target surface ; and

a substrate carrier remote from and opposite to the target surface of said magnetron source.

37. - 48. (cancelled)

49. (new) A method of manufacturing substrates with a vacuum plasma treated surface, comprising :

- providing a target with a target surface;
- providing at least one substrate distinct from and opposite said target surface having a substrate surface;
- generating in the volume between said target surface and said substrate surface a magnetic field pattern of
  a) a magnetron magnetic field pattern forming a closed loop considered in direction towards said target surface and, considered parallel to said target surface, tunnel-like arcing from an outer area

loop of a first magnetic pole to an inner area of a second magnetic pole

b) an asymmetric unbalanced long range magnetic field pattern by a first magnetic field component generated by an increased magnetic flux along said outer loop area relative to magnetic flux along said inner area and a second magnetic field component generated along a section of said outer loop area

- generating a plasma discharge in said magnetic field pattern;
- plasma treating said substrate surface;
- sweeping said asymmetric unbalanced long-range magnetic field pattern along said substrate surface.

50. (new) The method of claim 49, further comprising controlling said asymmetric unbalanced long-range magnetic field pattern by said second magnetic field component.

51. (new) The method of claim 49, further comprising generating said magnetron magnetic field pattern along said outer loop area and said first magnetic field component by the same magnet arrangement along said outer loop area.

52. (new) The method of claim 49, further comprising establishing said asymmetric unbalanced long-range magnetic field pattern to result in a magnetic field component at said substrate surface and parallel thereto of at least 0.1 Gauss.

53. (new) The method of claim 52, wherein said component of magnetic field at said substrate surface is elected to be between 1 Gauss and 20 Gauss.

54. (new) The method of claim 49, said plasma treating said substrate surface being sputter-coating with a material comprising a material sputtered off said target surface.

55. (new) The method of claim 49, further comprising establishing said magnetron magnetic field pattern to cover at least 60% of said target surface.

56. (new) The method of claim 55, further comprising covering with said magnetron magnetic field pattern at least 85% of said target surface.

57. (new) The method of claim 49, further comprising the step of generating said first magnetic field component, substantially homogeneous along said outer loop area.

58. (new) The method of claim 49, further comprising generating said second magnetic field component, by an electromagnet arrangement.

59. (new) The method of claim 49, further comprising sweeping said magnetron magnetic field pattern along said substrate surface.

60. (new) The method of claim 49, further comprising sweeping said asymmetric unbalanced long-range magnetic field pattern along said substrate surface by a circular movement around an axis perpendicular to said target surface.

61. (new) The method of claim 49, further comprising sweeping said magnetron field pattern along said substrate surface by a circular movement around an axis perpendicular to said target surface and offset from a geometrical center of said inner area.

62. (original) The method of claim 49, including generating by said asymmetric unbalanced long-range magnetic field pattern an area of maximum plasma density adjacent a periphery of said substrate surface

wherein said sweeping includes sweeping said area of maximum plasma density adjacent and along said periphery.

63. (new) The method of claim 49, wherein said plasma treating said substrate surface includes providing a current of ions at said substrate surface and adjusting the density distribution of said ions current at said substrate surface by adjusting said second magnetic field component.

64. (new) The method of claim 49, generating said second magnetic field component, comprising generating a magnetic field by at least one coil with a coil axis substantially parallel to said target surface.

65. (new) The method of claim 49, generating said second magnetic field component, comprising generating a magnetic field by means of at least one coil with a coil axis substantially parallel to said target surface and generating said sweeping including supplying said at least one coil with a current varying in time.

66. (new) The method of claim 49, wherein generating said second magnetic field component includes generating magnetic fields by more than one coil with coil axes substantially parallel to said target surface, generating said sweeping comprising supplying said more than one coil by supply signals varying mutually differently in time.

67. (new) The method of claim 49, comprising providing more than one of said substrate.

68. (new) The method of claim 49, further comprising selecting said at least one substrate to be circular or arranged within a circular area and wherein said sweeping includes a movement around a center axis of said circular substrate or circular area.

69. (new) The method of claim 49 further comprising electrically feeding said plasma by a pulsating supply signal.

70. (new) The method of claim 69, further comprising selecting a frequency f of said pulsating to be

$$5\ kHz \leq f \leq 500\ kHz.$$

71. (new) The method of claim 70, comprising selecting said frequency f to be

$$100kHz \leq f \leq 200\ kHz.$$

72. (new) The method of claim 69, further comprising selecting the duty cycle of said pulsating to have 1 % to 99 % off-times (both values included).

73. (new) The method of claim 72, comprising selecting said duty cycle to have 35% to 50% off-times (both limits included).

74. (new) The method of claim 49, further comprising establishing in said volume a vacuum of a total pressure p to be at most 10^{-1}Pa.

75. (new) the method of claim 74, further comprising selecting said pressure p to be

$$10^{-2}\ Pa \leq p \leq 5\ X\ 10^{-2}\ Pa.$$

76. (new) The method of claim 49, further comprising blasing said substrate with an Rf frequency power.

77. (new) The method of claim 76, further comprising adjusting energy of ions in said plasma towards said substrate surface by adjusting said Rf power.

78. (new) The method of claim 49, wherein said target surface comprises a material selected from the group consisting of titanium, tantalum and copper.

79. (new) A method of manufacturing substrates with a vaduum plasma treated surface, comprising:

- providing a target with a planar target surface
- providing at least one substrate distinct from and opposite said target surface, having a substrate surface
- generating in the volume between said target surface and said substrate surface a magnetic field pattern of

  a) magnetron field pattern forming a closed loop considered in direction towards said target surface and considered parallel to said target surface, tunnel-like arcing from an outer loop area of a first magnetic pole to an inner area of a second magnetic pole

  b) an asymmetric, unbalanced long-range magnetic field pattern,
- generating a plasma discharge in said magnetic field pattern
- plasma treating said substrate surface
- sweeping said asymmetric unbalanced long range magnetic field pattern along said substrate surface.

80. (new) The method of claim 79, further comprising generating said asymmetric unbalanced long-range magnetic field pattern by generating a first magnetic field component generated by an increased magnetic flux along said outer loop area related to magnetic flux along said inner area and a second magnetic field component generated along a section of said outer loop area.

81. (new) The method of claim 80, comprising generating said first magnetic field component by homogeneously increasing said magnetic flux along said outer loop area related to magnetic flux along said inner area.

82. (new) The method of claim 80, generating said second magnetic field component, comprising generating a magnetic field by at least one electromagnet.

83. (new) The method of claim 80, generating said second magnetic field component, comprising generating a magnetic field by means of at least one coil with a coil axis parallel to said target surface, said sweeping comprising supplying said at least one coil with supply signals varying in time.

84. (new) The method of claim 80, further comprising controlling said asymmetric unbalanced long-range magnetic field pattern by said second magnetic field component.

85. (new) The method of claim 80, further comprising generating said magnetron magnetic field pattern along said outer loop area and generating said first magnetic field component by a same arrangement of magnets.

86. (new) The method of claim 79, further comprising establishing said asymmetric, unbalanced long-range magnetic field pattern so as established at said substrate surface a magnetic field component parallel to said substrate surface of at least 0.1 Gauss.

87. (new) The method of claim 86, wherein said component at and parallel to said substrate surface is selected to be between 1 Gauss and 20 Gauss.

88. (new) The method of claim 79, said plasma treating comprising coating said substrate surface with a material comprising material sputtered off said target surface.

89. (new) The method of claim 79, wherein said magnetron magnetic field pattern covers at least 60% of said target surface.

90. (new) The method of claim 79, further comprising sweeping said magnetron magnetic field pattern and said asymmetric unbalanced long-range magnetic field pattern along said substrate surface.

91. (new) The method of claim 79, further comprising more than a least one substrate relative to said target surface.

92. (new) A magnetron source, comprising

- a target with a target surface and an opposite surface
- a magnet arrangement adjacent said opposite surface and having

  a) at least one first magnet subarrangement

  b) at least one second magnet subarrangement

  c) said first magnet subarrangement having a first area pointing towards said opposite surface and of one magnetic polarity

  d) said second magnet subarrangement having a second area pointing towards said opposite surface and of the other magnetic polarity

  e) said second area forming a loop around and distinct from said first area

  f) said first area generating a first magnetic flux through said target surface

  g) said second area generating a second magnetic flux through said target surface

  h) said second magnetic flux being larger than said first magnetic flux

  i) a third magnet subarrangement, generating a magnetic flux superimposed upon said second magnetic flux along a section of said second area,

j) a sweeping arrangement, moving at least said magnetic flux of said third magnet subarrangement along said target surface.

93. (new) A magnetron source, comprising

- a target with a planar target surface and an opposite surface;
- a magnet arrangement adjacent said opposite surface and having:

a) at least one first magnet subarrangement;

b) at least one second magnet subarrangement;

c) said first magnet subarrangement having a first area pointing towards said opposite surface and of one magnetic polarity;

d) a second magnet subarrangement having a second area pointing towards said opposite surface and of the other magnetic polarity;

e) said second area forming a loop around and distant from said first area;

f) said first area generating a first magnetic flux through said target surface;

g) said second area generating a second magnetic flux through said target surface;

h) said second magnetic flux being larger than said first magnetic flux;

i) said second magnetic flux being unevenly distributed along said second area;

j) a sweeping arrangement moving at least said unevenly distributed magnetic flux along said target surface.

94. (new) A method of manufacturing a vacuum plasma treated substrate including:

generating a plasma in a vacuum volume wherein there prevails a magnetron magnetic field pattern and an unbalanced symmetric long-range magnetic field pattern to which, in a distinct area, there is superimposed a further magnetic field to result in an asymmetrically unbalanced long-range magnetic field pattern and

sweeping the resulting asymmetric unbalanced long-range magnetic field pattern along a surface of said substrate during treatment.

95. (new) A magnetron treatment chamber comprising:

a magnetron source including

- a target with a planar target surface and an opposite surface;
- magnet arrangement adjacent said opposite surface and having:

a) at least one first magnet subarrangement;

b) at least one second magnet subarrangement;

c) said first magnet subarrangement having a first area pointing towards said opposite surface and of one magnetic polarity;

d) a second magnet subarrangement having a second area pointing towards said opposite surface and of the other magnetic polarity;

e) said second area forming a loop around and distinct from said first area;

f) said first area generating a first magnetic flux through said target surface;

g) said second area generating a second magnetic flux through said target surface;

h) said second magnetic flux being larger than said first magnetic flux;

i) said second magnetic flux being unevenly distributed along said second area;

j) a sweeping arrangement moving at least said unevenly distributed magnetic flux along said target surface; and

a substrate carrier remote from and opposite to the target surface of said magnetron source.